



300/1200 MODEMS TECHNICAL PROCEDURES

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TROUBLESHOOTING

Introduction

Most of the problems with modems will occur during the installation procedures. Other problems may occur only with certain baud rates or modes of operation. The purpose of this document is to give Apple Dealer Service-persons step-by-step checkout procedures to test, evaluate, and diagnose any failure related to the operation of either the Apple 300 or Apple 1200 MODEMS. These procedures can be performed using either an Apple II+, Apple //e or Apple ///. For testing and troubleshooting of modems connected to Macintosh or Lisa systems, refer to the Modem Manual (Part II) for those systems.

A. Modem Self-Test

Equipment Required:

Modem 300/1200 User's Manual (Part I: Reference)
Apple II+, //e, or /// system with drive and monitor
Apple Term program diskette (Apple Term II or Apple Term III)
Super Serial Card (for Apple II+ or //e only)
Modem 300/1200 User's Manual (Part II for Apple // or ///)
NOTE: There are two Part II manuals, one for Apple II+ and //e systems, and one for Apple /// systems. Use the one that matches your system.

1. Connect the modem to a telephone line according to the instructions on page 14 (start at the top of the page) of the Modem 300/1200 User's Manual (Part I: Reference).
2. Complete the modem hook-up to your computer according to the instructions in chapter 1 of the Modem 300/1200 User's Manual (Part II).
3. Run the self-test given in chapter 1 (see Testing with the Self-Test Procedure) of the Modem 300/1200 User's Manual (Part II).
4. After completing the self-test, press and hold down the <OPEN-APPLE> key and type "Q" (//e) or hold down the <ESCAPE> key and type "Q" (II+) to return to the main menu.
5. Type "C" to enter the **Change Configuration** menu. You will now select a different speed and repeat the self test.



6. Use the arrow keys (//e) or arrow keys and space bar (II+) to select 110 baud.
7. Repeat steps 3 and 4. Press <ESCAPE> to return to the main menu.
8. If you are testing a 300 baud modem, skip this step and go on to step 9. Type "C" to enter the **Change Configuration** menu. Use the arrow key (//e) or <SPACE> (II+) to select 1200 baud. Repeat steps 3 and 4.
9. Return the baud setting to 300 baud.
10. If the self-test passes skip over this step and perform the **MODEM VERIFICATION TEST** on the next page. If the self-test fails, check your installation using the checklist below:
 - Verify the setting of the switches on the back of your modem.
 - Is the modem data cable securely connected to the computer and to the modem?
 - Is the modem power module connected to the modem?
NOTE: Inspect the modem power module connector for bent or missing pins?
 - Is the modem power module plugged into an electrical outlet?
 - Is the modem turned on?
 - Verify the setting of the DIP switches on the Super Serial Card (Apple II+ or //e only).
 - Verify that the jumper block on the Super Serial Card has its triangle pointing to the word MODEM (Apple II+ or //e only).

If no problems are found during the installation check, replace the following modules (in the order listed) one at a time and rerun the self-test:

- power module
- modem data cable
- modem PCB

After isolating and repairing the problem, continue on to the **MODEM VERIFICATION TEST** on the next page.



B. Modem Verification Test

This test will verify the correct operation of the modem and the telephone lines.

Equipment Required:

Apple II+, //e, or /// system with drive and monitor
Super Serial Card (if Apple II+ or //e is used)
Apple Term program diskette
Local telephone line and a user service

NOTE: The user service may be a local bulletin board or any data service as long as the baud rate and protocol are known and can be verified. Do not attempt to test a modem by dialing an unverified user service. The results will be very confusing.

1. Obtain the telephone number of a compatible user service.
2. From the Apple Term main menu, type "U" to enter the phone directory menu.
3. Add the telephone number of the user service by holding down the <OPEN-APPLE> key and typing "A" (//e) or holding down the <CONTROL> key and typing "A" (II+). The cursor will appear at the first available line on the telephone list.
4. Type a name or label that lets you identify the number to be added. Press <RETURN> and the cursor will move to the number column.
5. Type the complete telephone number including any prefixes required to get an outside line. Do not use spaces or dashes to separate parts of the telephone number. Press <RETURN> when you are finished entering the telephone number.
6. Press <ESCAPE> to get out of the phone directory screen and return to the main menu.
7. Type "E" to enter the terminal mode.



8. Hold down the <OPEN-APPLE> key and type "D" (//e) or hold down the <CONTROL> key and type "D" (II+) - this will automatically dial the number you entered.

NOTE: If the **CONNECT** message appears on your monitor screen and a message from the user service you dialed appears, your modem is working properly. If a **NO CARRIER** message appears on your screen, your modem was unable to connect you with the number selected and you should replace the following components (one at a time) in the order listed:

- telephone cable
- modem power module
- modem PCB
- modem data cable

After isolating and repairing the problem, verify correct operation by running the **MODEM VERIFICATION TEST** again.

C. Back-to-Back Test

This is an optional test that requires two complete computer systems and two identical modems. Perform this test only when a customer's modem does not function correctly, but no problem can be found by running the **SELF-TEST** or **MODEM VERIFICATION TEST**.

Equipment Required:

- (2) Apple II+, //e, or /// systems with drives and monitors
- (2) Super Serial Card (one for each computer if Apple II+ or //e is used)
- (2) Apple Term program diskettes
- (2) identical modems (one modem must be a known good unit)
- (2) local telephone lines (two separate phone lines must be used)

If the modem fails any steps of this procedure, replace the modem power module and repeat the test. If that does not cure the problem, replace the modem PCB and repeat the test. If the modem passes all steps of this procedure, the **SELF-TEST**, and the **MODEM VERIFICATION TEST**, but the customer still cannot get the modem to work at their site, have the customer contact the telephone company to investigate their telephone line.



1. With both modems installed according to the User's Manual instructions, turn the computers and modems on and boot the Apple Term software on both systems.
2. On the system with the suspected bad modem, type "U" to enter the phone directory menu.
3. Add the telephone number of the known good modem to the phone directory by holding down the <OPEN-APPLE> key and typing "A" (//e) or holding down the <CONTROL> key and typing "A" (II+). The cursor will appear at the first available line on the telephone list.
4. Press <RETURN> and the cursor will move to the number column.
5. Type the telephone number of the known good modem. Do not use spaces or dashes to separate parts of the telephone number. Press <RETURN> when you are finished entering the telephone number.
6. Press <ESCAPE> to get out of the phone directory screen and return to the main menu.
7. Type "E" on both computers to enter the terminal mode.
8. On the system with the suspected bad modem, hold down the <OPEN-APPLE> key and type "D" (//e) or hold down the <CONTROL> key and type "D" (II+) - this will automatically dial the number you entered (the known good modem). The **CONNECT** message should appear on your monitor screen; if it does, go to step 9. If a **NO CARRIER** message appears on your screen, check the setup of both modems and computers, then dial again. If a **NO CARRIER** message appears again, turn both modems and computers off, replace the PCB in the suspected bad modem, and start the test again from step 1. If the test passes, the modem PCB was faulty.
9. On the system with the suspected bad modem, type a short message and verify that it is displayed on the screen of the system with the known good modem.
10. On the system with the known good modem, type a short message and verify that it is displayed on the screen of the other system (the suspected bad modem).
11. On the system with the suspected bad modem, hold down the <OPEN-APPLE> key and type "H" (//e) or hold down the <ESCAPE> key and type "H" (II+) to hang up the modem. The screen should now have the message **NO CARRIER**.



12. On the system with the known good modem, hold down the <OPEN-APPLE> key and type "Q" (//e) or hold down the <ESCAPE> key and type "Q" (II+) to return to the main menu.
13. Type "U" to enter the phone directory menu.
14. Add the telephone number of the suspected bad modem to the phone directory by holding down the <OPEN-APPLE> key and typing "A" (//e) or holding down the <CONTROL> key and typing "A" (II+). The cursor will appear at the first available line on the telephone list.
15. Press <RETURN> and the cursor will move to the number column.
16. Type the telephone number of the suspected bad modem. Do not use spaces or dashes to separate parts of the telephone number. Press <RETURN> when you are finished entering the telephone number.
17. Press <ESCAPE> to get out of the phone directory screen and return to the main menu.
18. Type "E" to enter the terminal mode.
19. Hold down the <OPEN-APPLE> key and type "D" (//e) or hold down the <CONTROL> key and type "D" (II+) - this will automatically dial the number you entered (the suspected bad modem). The **CONNECT** message should appear on your monitor screen; if it does, go to step 20. If a **NO CARRIER** message appears on your screen, check the setup of both modems and computers, then dial again. If a **NO CARRIER** message appears again, turn both modems and computers off, replace the PCB in the suspected bad modem, and start the test again from step 1. If the test passes, the modem PCB was faulty.
20. Hold down the <OPEN-APPLE> key and type "H" (//e) or hold down the <ESCAPE> key and type "H" (II+) to hang up the modem. The screen should now have the message **NO CARRIER**.
21. Hold down the <OPEN-APPLE> key and type "Q" (//e) or hold down the <ESCAPE> key and type "Q" (II+) to return to the main menu.
22. Type "C" to enter the **Change Configuration** menu. Use the arrow keys to select touch-tone dialing.
23. Press <ESCAPE> to return to the main menu.



24. Type "E" to enter the terminal mode.
25. Hold down the <OPEN-APPLE> key and type "D" (//e) or hold down the <CONTROL> key and type "D" (II+) - this will automatically dial the number you entered.
26. When the **CONNECT** message appears, type a short message and verify that it is displayed on the screen of the suspected bad modem. If the **CONNECT** message did not appear, or if the message you typed was not displayed on the suspected bad modem, replace the PCB in the suspected bad modem and run this test again.

TAKE-APART

NOTE: There are two types of Modem 1200 PCB's, one that requires a sprayed case and one that does not. The sprayed Modem 1200 service stock and exchange modules cannot be used to repair the unsprayed Modem 1200's. See the Illustrated Parts List for the differing service stock part numbers for the sprayed case Modem 1200 and the unsprayed case Modem 1200.

PCB Removal

1. Carefully pry off the two rubber feet from the bottom front of the modem.
2. Remove the four screws holding the two case halves together.
3. Remove the bottom cover and set it aside.
4. Lift out the modem PCB.
5. Remove the service spare modem from the shipping box. Notice that the top and bottom covers are labeled "service use only". These covers must be returned with the faulty board for service credit.
6. Remove the service replacement board in the same way as you did the customers board. Replace the bad board with the service spare, after first confirming that the two are the same model.
7. Place the bad board on the service covers and fill out the service repair order information. Ship the bad board and/or modem power module to the Apple Service Center for credit.



Apple Modem Technical Procedures

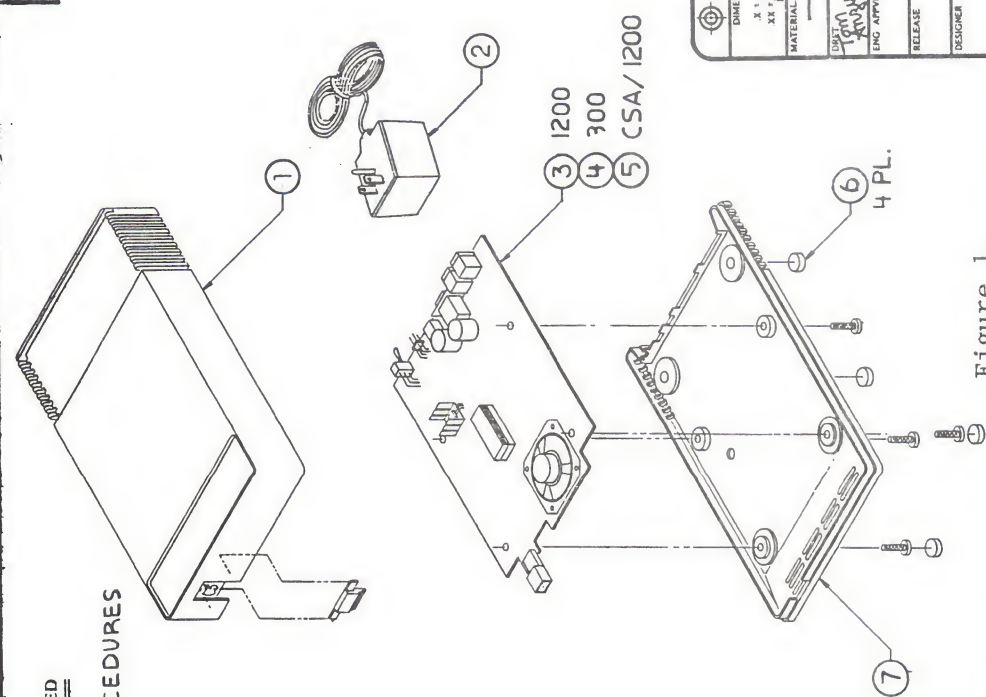
Section 2

Illustrated Parts List

The figures and lists below include all piece parts that can be purchased separately from Apple for the Apple Modem, along with their part numbers. These are the only parts available from Apple. Refer to your Apple Service Programs manual for prices.

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NOTE: UNLESS OTHERWISE SPECIFIED
1 MANUAL REFERENCE
LEVEL 1 TECH. PROC.
072-0062

REV. ZONE	ECO #	REVISION	APPD	DATE
A		5493	INITIAL	RELEASE

DRAWING NUMBER	SHT
070-0182-A	1/2


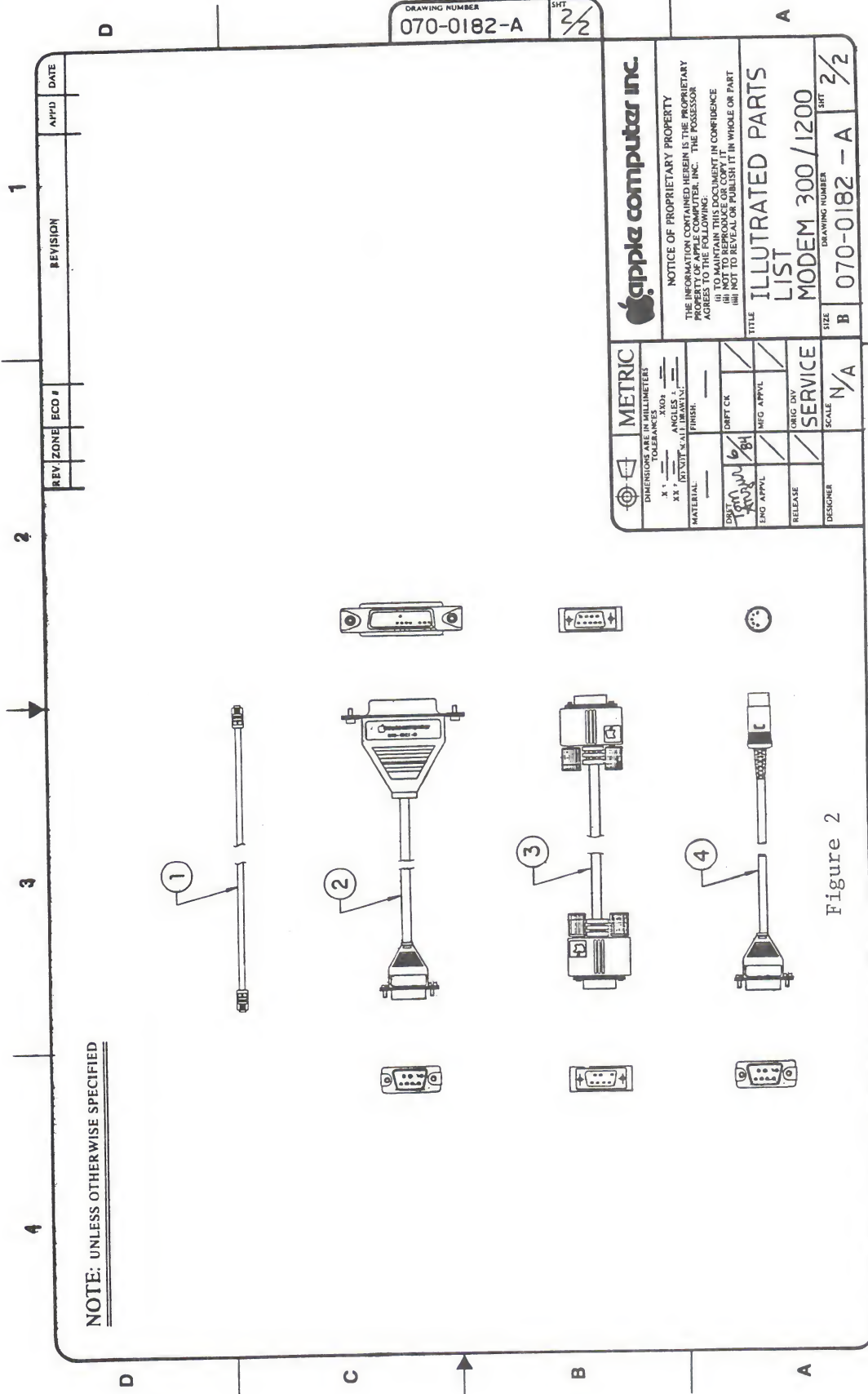
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TITLE ILLUSTRATED PARTS LIST		MODEM 300/1200	
DRAWING NUMBER 070-0182-A		SIZE B	DATE 1/2
SCALE N/A			
METRIC DIMENSIONS ARE IN MILLIMETERS (CONVERSION TABLE ATTACHED) X 1 _____ X 2 _____ X 4 _____ X 8 _____ X 16 _____ X 32 _____ X 64 _____ X 128 _____ X 256 _____ X 512 _____ X 1024 _____ X 2048 _____ X 4096 _____ X 8192 _____ X 16384 _____ X 32768 _____ X 65536 _____ X 131072 _____ X 262144 _____ X 524288 _____ X 1048576 _____ X 2097152 _____ X 4194304 _____ X 8388608 _____ X 16777216 _____ X 33554432 _____ X 67108864 _____ X 134217728 _____ X 268435456 _____ X 536870912 _____ X 1073741824 _____ X 2147483648 _____ X 4294967296 _____ X 8589934592 _____ X 17179869184 _____ X 34359738368 _____ X 68719476736 _____ X 137438953472 _____ X 274877906944 _____ X 549755813888 _____ X 1099511627776 _____ X 2199023255552 _____ X 4398046511104 _____ X 8796093022208 _____ X 17592186044416 _____ X 35184372088832 _____ X 70368744177664 _____ X 140737488355328 _____ X 281474976710656 _____ X 562949953421312 _____ X 1125899906842624 _____ X 2251799813685248 _____ X 4503599627370496 _____ X 9007199254740992 _____ X 18014398509481984 _____ X 36028797018963968 _____ X 72057594037927936 _____ X 144115188075855872 _____ X 288230376151711744 _____ X 576460752303423488 _____ X 1152921504606846976 _____ X 2305843009213693952 _____ X 4611686018427387904 _____ X 9223372036854775808 _____ X 18446744073709551616 _____ X 36893488147419103232 _____ X 73786976294838206464 _____ X 147573952589676412928 _____ X 295147905179352825856 _____ X 590295810358705651712 _____ X 1180591620717411303424 _____ X 2361183241434822606848 _____ X 4722366482869645213696 _____ X 9444732965739290427392 _____ X 18889465931478580854784 _____ X 37778931862957161709568 _____ X 75557863725914323419136 _____ X 151115727451828646838272 _____ X 302231454903657293676544 _____ X 604462909807314587353088 _____ X 1208925819614629174706176 _____ X 2417851639229258349412352 _____ X 4835703278458516698824704 _____ X 9671406556917033397649408 _____ X 19342813113834066795298816 _____ X 38685626227668133590597632 _____ X 77371252455336267181195264 _____ X 154742504910672534362390528 _____ X 309485009821345068724781056 _____ X 618970019642690137449562112 _____ X 1237940039285380274899124224 _____ X 2475880078570760549798248448 _____ X 4951760157141521099596496896 _____ X 9903520314283042199192993792 _____ X 19807040628566084398385987584 _____ X 39614081257132168796771975168 _____ X 79228162514264337593543950336 _____ X 158456325028528675187087900672 _____ X 316912650057057350374175801344 _____ X 633825300114114700748351602688 _____ X 1267650600228229401496703205376 _____ X 2535301200456458802993406410752 _____ X 5070602400912917605986812821504 _____ X 10141204801825835211973625643008 _____ X 20282409603651670423947251286016 _____ X 40564819207303340847894502572032 _____ X 81129638414606681695789005144064 _____ X 162259276829213363391578010288128 _____ X 324518553658426726783156020576256 _____ X 649037107316853453566312041152512 _____ X 1298074214633706907132624082305024 _____ X 2596148429267413814265248164610048 _____ X 5192296858534827628530496329220096 _____ X 10384593717069655257060992658440192 _____ X 20769187434139310514121985316880384 _____ X 41538374868278621028243970633760768 _____ X 83076749736557242056487941267521536 _____ X 166153499473114484112975882535043072 _____ X 332306998946228968225951765070086144 _____ X 664613997892457936451903530140172288 _____ X 1329227995784915872903807060280344704 _____ X 2658455991569831745807614120560689408 _____ X 5316911983139663491615228241121378816 _____ X 10633823966279326983230456482242757632 _____ X 21267647932558653966460912964485515264 _____ X 42535295865117307932921825928971030528 _____ X 85070591730234615865843651857942061056 _____ X 170141183460469231731687303715884122112 _____ X 340282366920938463463374607431768244224 _____ X 680564733841876926926749214863536488448 _____ X 1361129467683753853853498429727072976896 _____ X 2722258			

Figure 1



APPLE MODEM (Figure 1)

Item	Part No.	Description
1	815-0790	Top Cover
2	076-8077	Transformer, Cable Assembly
3	661-75164	PCB, Modem 1200
4	661-75165	PCB, Modem 300
5	661-0293	PCB, Modem 1200, w/CSA
6	865-0003	Rubber Foot
7	815-0791	Bottom Cover





APPLE MODEM CABLES & CONNECTORS (Figure 2)

Item	Part No.	Description
1	076-8075	Cable Assembly, RJ-11
2	590-0121	Cable Assembly, Interface, (II,///, Lisa/Macintosh XL)
3	590-0197	Cable Assembly, Interface (Macintosh)
4	590-0192	Cable Assembly, Interface (IIC)

